REMARKS

Firstly, Applicant would like to thank the Examiner for a telephonic interview and an understanding of the Examiner's thoughts.

Applicant has added new claims 5 and 6. Applicant respectfully submits that these new claims 5 and 6 are supported by the application as originally filed and do not contain any new matter. Accordingly, the Office Action will be discussed in terms of the claims as amended.

The Examiner has rejected claims 1 and 3 under 35 USC 103 as being obvious over Zimmerman et al. in view of Shimada et al. and further in view of Ishihara et al., stating that Zimmerman et al. in Fig. 7A discloses a capacitance type sensor including a substrate 28, a group of fixed electrodes 30 provided on an upper face of the substrate 28, a movable electrode plate 60 having an electrode 62 on a lower face thereof, a gap provided between the group of fixed electrodes 30 on the substrate 90 and the electrode 62 on the movable electrode 60, a movable electrode 60 having a rubber elasticity, but does not mention at least a solder layer having a thickness; Shimada et al. teaches a well-known feature of a solder layer 202 which supports the movable electrode 201, but does not mention that the solder layer is a conductive solder layer; Ishihara teaches a thin resilient metal sheet 38 which supports the movable electrode plate and the metal sheet 38 is clearly a conductive material; and it would have been obvious to one of ordinary skill in the art to modify Zimmerman et al. in view of the teachings of Shimada et al. and Ishihara et al.

In reply thereto, Applicant has carefully reviewed Zimmerman et al. and respectfully submits that while Zimmerman et al. may disclose some of the elements which the Examiner suggests it does, Applicant respectfully submits that Zimmerman et al. does not show, suggest or teach the utilization of a conductive solder layer to support the movable electrode plate and provide a gap between the fixed electrodes on the substrate and the electrode on the movable electrode plate, as is admitted by the Examiner. To fill this void, the Examiner has referred to Shimada et al.

Applicant has carefully reviewed Shimada et al. and respectfully submits that Shimada et al. in Fig. 12 and at col. 9, lines 45-52 is completely silent as to the solder layer and Applicant respectfully submits that Shimada et al. merely discloses a sensor that includes a support 202 for supporting the movable electrodes 201 to provide a gap 205 (see Fig. 11, col. 9, lines 11-16 and Fig. 6, col. 9, lines 49-50). In addition, during the telephonic interview, the Examiner suggested

that while Shimada et al. does not particularly and directly teach that the support 202 is made from conductive solder, Shimada et al. clearly teaches a support 1250 which is similar to the support 202 which has any value of electrical conductivity (see col. 10, lines 52-56).

In reply thereto, Applicant respectfully submits that solder is a word of art and is a metal alloy which is highly electrically conductive and made of lead and tin and is well known in the art as a highly electrically conductive material (see the attached copy from the Wikipedia which defines solder and also as it is described in and shown in the figures of applicants application). Therefore, Applicant respectfully submits that the term solder is not a vague and all encompassing term for any conductive material. Still further, the Examiner suggests that the support 202 or 1250 must be a metal alloy because it has electrical conductivity. Applicant respectfully submits that electrical conductivity can have any value from a high one such as a conductor to a low one such as for an insulator and is in fact the reciprocal of the electrical resistant (see attached copy of Wikipedia defining electrical conductivity). Accordingly, Applicant respectfully submits that at col. 10, lines 52-54 wherein it states:
"The support 1250 may have any value of electric conductivity since there is the insulator film 1211 on the fixed electrode 1240" does not mean that the support 1250 is a conductor and in fact could mean that the support 1250 is an insulator since electrical conductivity can vary from a very low value to a very high value for insulators to conductors. In support of Applicant's position, Applicant directs the Examiner's attention to col. 10, lines 54-56 wherein it states: "However, it is preferable that the support is made of an insulator in order to suppress parasitic capacitance as described later." Based on this statement, Applicant respectfully submits that Shimada et al. clearly suggests and teaches that the support 1250 is in fact made from an insulator. In addition, Applicant respectfully submits that the language contained at lines 52-56 clearly indicates that there is no electrical connection through the support 1250 and either the electrical insulation is provided by the insulator film 1211 or by the fact that support 1250 is made from an insulator. In contrast thereto, in Applicant's invention the solder layer provides an electrical connection. Therefore, Applicant respectfully submits that there is no showing, suggestion or teaching in Shimada et al. that one would utilize solder.

Still further, Applicant has carefully reviewed Ishihara et al. and respectfully submits that Ishihara et al. teaches the utilization of a metal sheet 38 and this thin resilient metal sheet 38 is formed into a circular domed shape and positioned in the case 38 on the outer fixed contact 33 to

be concentric with the case 31 and as a result, the domed shape of the resilient metal sheet 38 allows the domed shape resilient metal sheet 38 to be deformed by pressing force and contact the contacts 34-37 to function as a multi-directional operating switch and the resilient metal sheet 38 does not function as a support to provide a gap. Accordingly, Applicant respectfully submits that contrary to the Examiner's suggestion, Ishihara et al. does not suggest or teach a support, particularly a conductive support or a layer of conductive elastomer since sheet 38 is a domed shaped resilient metal sheet 38 to be deformed by pressing force and contact the contacts 34-37 to function as a multi-directional operating switch. Accordingly, Applicant respectfully submits that since Ishihara teaches a switch function and Shimada requires a support, one of ordinary skill in the art would not make the combination suggested by the Examiner to create applicant's invention.

In view of the above, therefore, Applicant respectfully submits that claims 1 and 3 are not obvious over Zimmerman et al. in view of Shimada et al. and further in view of Ishihara et al.

In addition, Applicant respectfully submits that the newly added claims 5 and 6 are not anticipated by nor obvious over the art of record, taken singly or in combination.

Applicant also further acknowledges the allowance of claims 2 and 4.

In view of the above, therefore, it is respectfully requested that this Amendment be entered, favorably considered and the case passed to issue.

Please charge any additional costs incurred by or in order to implement this Amendment or required by any requests for extensions of time to KODA & ANDROLIA DEPOSIT ACCOUNT NO. 11-1445.

Respectfully submitted,

KODA & ANDROLIA

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Solder

From Wikipedia, the free encyclopedia.

Solders are metal alloys (often of tin and lead), usually with low melting points, that are melted and used to join metallic surfaces, especially in the fields of electronics and plumbing.

In **electronics**, tin/lead solders are normally 60/40 by weight in order to produce a near-eutectic mixture (lowest melting point - below 190°C). The eutectic ratio of 63/37 corresponds closely to a Sn_3Pb intermetallic compound. According to the European Union Waste Electrical and Electronic Equipment (WEEE) and Reduction of Hazardous Substances (ROHS) directives, lead has to be eliminated from electronic systems by July 1, 2006, leading to much interest in lead-free solders. These contain tin, copper, silver and other metals in varying amounts.

In **plumbing**, a higher proportion of lead was used. This had the advantage of making the alloy freeze more slowly, so that it could be wiped over the joint to ensure watertightness. With the replacement of lead water pipes by copper, the lead in plumbing solder was replaced by copper, and the proportion of tin increased.

Hard solder, as used for brazing, is generally a copper/zinc or copper/silver alloy, and melts at higher temperatures.

Solder is commonly mixed with, or used with flux, which is a reducing agent designed to help remove impurities (specifically oxidised metals) from the points of contact to improve the electrical connection. For convenience, solder is often manufactured as a hollow tube and filled with flux. Most cold solder is soft enough to be rolled and packaged as a coiled making for a convenient and compact solder/flux package.

See also: soldering iron

Resources

- Soldering from BYU.edu
- Open University Solder Research Group

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Electrical conductivity

From Wikipedia, the free encyclopedia.

Electrical conductivity is a measure of how well a material accommodates the transport of electric charge. Conductance is an electrical phenomenon where a material contains movable particles of electricity. When a difference of electrical potential is placed across a conductor, its movable charges flow, and an electric current appears.

A conductor such as a metal has high conductivity, and an insulator like glass, or the vacuum, has low conductivity. A semiconductor has a conductivity that may vary with conditions, such as exposure of the material to certain frequencies of light.

Electrical conductivity is the reciprocal of electrical resistivity (ohms). Its SI derived unit is the siemens (named after Werner von Siemens) per meter ($A^2s^3m^{-3}kg^{-1}$). It is the ratio of the current density to the electric field strength. This applies also to the electrolytic conductivity of a fluid.

For a discussion of the physical origin of electrical conductivity, see electrical conduction.